# 7. I-405 Plan: Transit and HOV

Improving the I-405 Transit/HOV System is integral to increasing mobility within the corridor. A Bus Rapid Transit system (BRT), running the entire length of I-405, is the backbone of the I-405 Plan transit recommendation. BRT combines many qualities of rail transit with the flexibility and cost-effectiveness of buses. It will operate along I-405 in the HOV lanes with connections to other transit routes.

Local and regional buses, vanpools and carpools will also play major roles in reducing the number of vehicles on I-405. Currently 20 percent of the people in the HOV lane are in buses while carpools and vanpools carry 80 percent of the people. The I-405 Plan proposes to increase transit service by up to 70 percent and vanpools nearly fivefold.

## HOV System


In 1991, WSDOT established a system of freeway HOV lanes for the Puget Sound region. The HOV system encourages the use of high occupancy modes of travel by improving speed and reliability for transit and ridesharers. Currently, the system includes 276 lane miles, stretching from Lakewood north to Everett, and from Seattle east to Issaquah, including I-405 and parts of I-5, SR-520 and I-90. The I-405 Plan builds on the existing HOV system by connecting HOV lanes to arterial streets through exclusive ramps and by increasing park-and-ride capacity and the development of inline BRT stations. The system will be supported through TDM including commute trip reduction programs and HOV-use incentives. A number of transit priority improvements will be made to selected arterials to move transit using dedicated lanes, transit signal priority and queue jumps. The focus of the I-405 HOV system is to move people, rather than vehicles.

An HOV system is necessary for BRT and transit effectiveness with all components working together as a comprehensive facility. Direct access to the HOV lanes is required to shorten BRT and transit travel times and improve service reliability.

# Transit System

| I-405 Corridor Service | 2007 Annual Hours* | Additional Hours 2007 to 2020* | 2020 Annual Hours |
|---|---|---|---|
| I-405 | 0 | 65,000 | 65,000 |
| Other Freeway and Arterial BRT | 248,000 | 298,000 | 546,000 |
| Local Transit and Commuter Express | 1,206,000 | 641,000 | 1,847,000 |
| **Total** | **1,454,000** | **1,004,000** | **2,458,000** |

Table 7-1: I-405 Transit Service Hours

## Service Structure

The I-405 Plan provides approximately 2.5 million revenue service hours annually. Transit service levels in the I-405 Plan are forecasted to increase up to 70 percent. Local bus routes will provide service from neighborhoods to activity centers and BRT stations. Service will be supported by new and improved transit centers and park-and-ride lots. Commuter express routes operating from neighborhoods and park-and-ride lots will directly connect to major employment centers. The approximate breakdown of local and regional transit service is shown in Table 7-1.

BRT service along the length of I-405 will serve longer-distance trips between major activity centers along the freeway. Arterial BRT or express routes will provide fast, reliable service between activity centers in some corridors not connected by freeways.

### I-405 BRT Service

The I-405 Plan utilizes BRT to provide all-day, high-speed travel that can be used without a schedule with buses coming every 10 minutes. Dedicated HOV lanes, direct access ramps, BRT right-of-way and stations designed to accommodate BRT buses will allow BRT to directly access HOV lanes without weaving in-and-out of general traffic. BRT fares are collected off-vehicle, similar to commuter rail.

I-405 BRT will generally follow the I-405 spine, operating on arterials when necessary to access major activity centers and/or park-and-ride lots, and will connect to similar BRT or regional express operations along major connecting freeways.

### Other Freeway BRT Services

BRT services to connect I-405 to other major freeways will be provided. These routes include:

- Issaquah to Northgate via I-90, I-405 and SR-520
- Woodinville to Bellevue to Downtown Seattle via SR-522, I-405 and I-90
- Everett Mall to Bellevue Transit Center via I-5 and I-405

- Federal Way to Auburn to Renton via SR-167
- Eastmont to Bellevue via SR-527 and I-405

### Arterial BRT Services

The BRT concept will be applied to selected arterials in the corridor. Arterial BRT routes will also be faster, more reliable and will offer facility enhancements not available as part of the conventional bus system. Arterial BRT will rely on consolidating stops, transit signal priority and limited arterial transit/HOV lanes.

An example of arterial BRT is the proposed Bellevue-Overlake-Redmond corridor, connected by NE 8th Street and 156th Avenue NE. BRT on this corridor will serve fewer stops than local bus service but more stops per mile than freeway BRT. It will use transit signal priority and transit queue jumps to get through traffic faster. It will not serve BRT stations in the same sense as freeway BRT, but will be supported by bus stops enhanced with better shelter, lighting and passenger information.

### Commuter Express Services

Commuter express services that connect neighborhoods or park-and-ride lots to major employment centers during peak periods will continue to expand to serve growing demand. Many of these regional express routes will use portions of the I-405 HOV system utilized by BRT.

### Local Transit Services

The Plan significantly increases local transit within the corridor. Services will be improved to connect with I-405 and other freeway and arterial BRT services. These revisions could include more center-to-center movements, neighborhoods-to-centers connections and a 'grid' transit system that supports multi-destination travel.

## Supporting Transit and HOV Facilities

A number of transit centers and park-and-ride lots will be expanded to accommodate increased transit service. New BRT stations, HOV direct access ramps and freeway-to-freeway HOV ramps will be built to support the I-405 BRT operating on the existing freeway HOV lanes. Arterial transit speed and reliability improvements will be made to support arterial BRT and local bus services.

For example, a new transit center is being designed by Sound Transit on the east side of I-405 near the Evergreen Healthcare campus and the Totem Lake Mall. The transit center will serve as a hub for local transit service. It will operate with new HOV direct access ramps at NE 128th Street to provide a convenient transit transfer point for commuters. The access ramps will include a new BRT station over I-405 and pedestrian features to maximize safety, weather protection and comfort.

### Transit Centers/Park-and-Ride Lots

A number of transit centers and park-and-ride lots will be expanded to support the increased transit services. Up to 5,000 additional park-and-ride spaces at existing and new lots will be built within the corridor. Parking needs at existing or new lots will also be determined.

### BRT Stations

The I-405 Plan calls for the construction of nine BRT Stations to provide safe pedestrian access and a comfortable waiting areas. Features would include weather protection, seating and/or leaning rails, distinctive signage that may include real-time information (i.e. "next bus" display) and route information (maps and schedules). Other potential features include security cameras, emergency telephones, landscaping and art.

Potential locations for new BRT stations are at the Lynnwood Transit Center, Canyon Park, NE 195th Street, NE 160th St., Totem Lake, Central Kirkland (NE 85th and/or NE 70th), Bellevue Transit Center, Factoria, Newport Hills, N 44th Street, N 8th Street, Renton Transit Center, Tukwila Commuter Rail Station, Southcenter, S 154th Street and/or Sea-Tac Airport.

### HOV Lanes

Currently, HOV lanes exist on I-405 from Tukwila to Lynnwood. BRT depends on HOV lanes and their smooth operation to keep service fast and reliable. The HOV lanes will be directly connected to major transit facilities using transit/HOV direct access ramps and inline stations. HOV priority treatments for selected arterials that connect to I-405 are also included in the I-405 Plan.

The HOV express lanes will be joint-use facilities serving transit, vanpools and carpools. However, traffic forecasts show that in 10 to 15 years, the HOV lanes will slow to a crawl during peak travel periods if 2-person carpools are still allowed. Therefore, by the year 2020, HOV lanes will need to be restricted to 3+ vehicles, at least during peak periods, to maintain capacity and mobility.

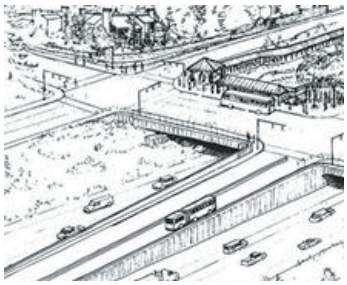


Figure 7-1

### HOV Direct Access Ramps

HOV direct access ramps connect freeway HOV lanes to the arterial system, avoiding the need for transit, carpools and vanpools to weave across traffic. For example, at Totem Lake, the I-405 at NE 128th Street/HOV Direct Access Improvement project will construct new HOV direct access ramps connecting I-405 to a new overcrossing at NE 128th Street, just south of the Kingsgate Park-and-Ride lot (see Figure 7-1).

The I-405 corridor has limited room for additional lane construction and in many cases, the freeway will need to be realigned, overpasses constructed and existing ramps moved to fit the new direct access ramps.

#### Freeway-to-Freeway HOV Connections

Drivers often use more than one freeway to travel from one place to another. To avoid forcing drivers out of HOV lanes when travelling through multiple regions, HOV lanes will be connected freeway-to-freeway. However, this kind of ramp can be very expensive and available right-of-way difficult to secure.

### Arterial HOV and Transit Priority Projects

Arterials are essential to a regional transportation network and towards transit and HOV mobility. The I-405 Program improvements will respond to the characteristics of the corridor's suburban arterial environment. These improvements will provide HOV and transit priority over SOV traffic, allowing it to bypass arterial congestion. Arterial improvements include the following types of projects:

**Transit Signal Priority** allows traffic light priority to buses and HOVs, providing more time to travel through the intersection.

**HOV Lanes** allow access only to transit, carpools and vanpools.

**BAT lanes** are restricted lanes on the roadway curbside for exclusive use by buses and right-turning vehicles. BAT lanes reduce bus delay by allowing them to avoid long lines in general-purpose lanes.

**Queue jumps** provide an exclusive lane at an intersection, for use by buses, HOVs and right-turning vehicles. A special green signal is provided to vehicles in the queue and a merge lane is provided on the other side of the intersection.

**Turn Restrictions** allow only HOVs to make turns at intersections, providing time savings during peak periods.

## Systems by Subarea

### North Subarea

BRT service in the North Subarea will run along the main spine of I-405. Other all-day BRT service will travel along SR-522 connecting to the HOV system at the Woodinville/I-405 interchange and continuing on Bothell Way NE to Lake Forest Park. Commuter express bus service will operate on SR-527 from Mill Creek and SR-522. Additional express service will operate on the Woodinville-Duvall Road, the Woodinville-Juanita Road and other select arterials. Transit priority improvements would be made to these arterials. New local transit service would be added throughout the area providing seamless BRT connections.

Access to the HOV system will improve with several new direct HOV access facilities. In the north, HOV improvements are envisioned at five locations — the I-405 interchange with I-5 at Swamp Creek, at SR-527 at Canyon Park, near NE 195th Street in Bothell, the interchange with SR-522 and at Totem Lake.

The BRT system initially will use the existing and planned park-and-ride lots and transit centers along the I-405 corridor. The Lynnwood transit center may be expanded and a

new one built in Woodinville. It is likely that BRT stations would be located at Lynnwood, Canyon Park, NE 195th, and Totem Lake, but final sites have not been identified.

Existing park-and-ride lots would be expanded and new ones built to add spaces for SE Snohomish County (800 spaces) and for Bothell, Kenmore and Woodinville (300 spaces).

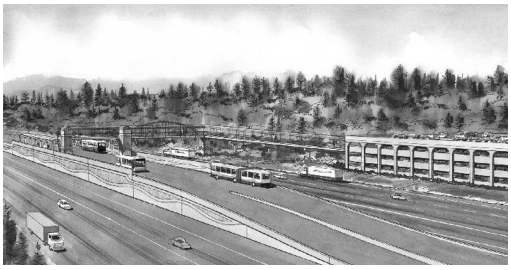
## Central Subarea

New BRT service in the Central Subarea of I-405 would work with other all-day BRT service on SR-520, NE 85th Street and I-90. Commuter express buses would operate on SR-520 and I-90 and on segments of 156th Ave NE, 164th Ave NE, Coal Creek Parkway, NE 70th Street, NE 85th Street, Avondale Road NE, Bellevue Way, Island Crest Way and other arterials. Transit priority improvements would be made to those arterials. Local transit service will also be added throughout the area with all-day service.

The BRT system initially would use the existing and committed park-and-ride lots and transit centers. Access would improve with the completion of a planned direct HOV access facility in downtown Bellevue. HOV improvements would also be built at the I-90, NE 85th Street and SR-520 interchanges with I-405. BRT stations in central Kirkland and Newcastle would connect riders with downtown Bellevue.

The Eastgate Direct Access project is an example of a project identified for the Central Subarea. The Eastgate Park-and-Ride lot is one of the more heavily used facilities in the region. However, HOVs currently do not have direct access to/from I-90 and struggle to reach the park-and-ride lot, slowing down the commute for everyone. This project will remove HOVs from general traffic and reduce congestion in the area. Metro is also building a five-story park-and-ride garage at the same location.

Existing park-and-ride lots in the area will be expanded and new lots identified. The needs are estimated as follows: Kirkland (300 spaces), Redmond (500 spaces), Mercer Island (300 spaces), and Bellevue (1200 spaces).



While the EIS analyses showed that a fixed-guideway transit system is not necessary for the entire corridor, to meet the 2020 transit ridership projections, the central segment of the corridor encompassing Bellevue, Redmond and Kirkland requires further consideration of other transit technologies. These opportunities include a cross-lake segment on I-90 or SR-520 and the central portion of the study area.

The central eastside area is the most densely developed section of the corridor, encompassing several regional urban centers and interchanges with I-90 and SR-520, two primary east-west transportation facilities. A sizeable HCT transit market already exists in this area and there is potential for substantial future growth in ridership before 2020.

## South Subarea

The BRT service would run along I-405 to the Sea-Tac Airport, although service will likely deviate onto arterial facilities through Renton and Tukwila. Other all-day BRT service would run on SR-167 connecting to the HOV system at the SR-167/I-405 interchange in Renton. Commuter express buses would operate on SR-167 from Kent, on South 208th Street, SR-515, SR-181, SR-900, the Maple Valley Highway (SR-169), and selected arterials in Renton. Transit priority improvements would be made to these arterials and state routes. New local service would be added throughout the area.

Similar to the rest of the corridor, the BRT system would initially use the existing and committed park-and-ride lots and transit centers along the I-405. Buses would use the HOV lanes in the existing HOV system. Access would improve as HOV direct access improvements are built at the I-405 intersection with I-5 at Tukwila, near SR-181, the SR-167 interchange and at NE 44th Street. Transit centers would be expanded in downtown Renton and the Tukwila Commuter Rail Station.

Existing park-and ride lots would be expanded or new ones built to add additional capacity for Tukwila (700 spaces), Kent (700 spaces) and Renton (200 spaces).

## Use of Burlington Northern Santa Fe Railroad (BNSF)

The existing BNSF railroad line in the corridor was examined as an alternative alignment for High Capacity Transit or as a bike and pedestrian trail. Recognizing the future potential of the BNSF right-of-way, a letter was sent to BNSF railroad and other interested I-405 agencies advising interest in using the line for future transportation purposes.

Opportunities to preserve the BNSF right-of-way, depending on what segments can be developed to serve transit demand, are uncertain at this time. HCT investment concepts in the I-405 corridor fall within the scope of Sound Transit's future planning. Any proposed HCT in the corridor will require voter approval.